



Spectral Gamma-Ray Borehole  
Log Data Report

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Borehole

40-02-08

Log Event A

### Borehole Information

Farm : <u>S</u>	Tank : <u>S-102</u>	Site Number : <u>299-W23-189</u>
N-Coord : <u>36,204</u>	W-Coord : <u>75,815</u>	TOC Elevation : <u>663.80</u>
Water Level, ft :	Date Drilled : <u>2/28/1974</u>	

### Casing Record

Type : <u>Steel-welded</u>	Thickness : <u>0.280</u>	ID, in. : <u>6</u>
Top Depth, ft. : <u>0</u>	Bottom Depth, ft. : <u>100</u>	

### Borehole Notes:

According to the driller's records, this borehole was not perforated or grouted. The casing thickness is presumed to be 0.280 in., on the basis of published thickness for schedule-40, 6-in. steel tubing.

### Equipment Information

Logging System : <u>1</u>	Detector Type : <u>HPGe</u>	Detector Efficiency: <u>35.0 %</u>
Calibration Date : <u>04/1996</u>	Calibration Reference : <u>GJPO-HAN-5</u>	Logging Procedure : <u>P-GJPO-1783</u>

### Log Run Information

Log Run Number : <u>1</u>	Log Run Date : <u>05/29/1996</u>	Logging Engineer: <u>Mike Widdop</u>
Start Depth, ft.: <u>0.0</u>	Counting Time, sec.: <u>100</u>	L/R : <u>L</u> Shield : <u>N</u>
Finish Depth, ft. : <u>5.5</u>	MSA Interval, ft. : <u>0.5</u>	Log Speed, ft/min.: <u>n/a</u>
Log Run Number : <u>2</u>	Log Run Date : <u>05/30/1996</u>	Logging Engineer: <u>Mike Widdop</u>
Start Depth, ft.: <u>4.5</u>	Counting Time, sec.: <u>100</u>	L/R : <u>L</u> Shield : <u>N</u>
Finish Depth, ft. : <u>100.0</u>	MSA Interval, ft. : <u>0.5</u>	Log Speed, ft/min.: <u>n/a</u>



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## Analysis Information

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Analyst : S.D. Barry

Data Processing Reference : P-GJPO-1787

Analysis Date : 02/19/1997

### Analysis Notes :

This borehole was logged in two log runs. The pre-survey field verification spectra from both log runs did not pass the acceptance criteria established for the peak shape and system efficiency. A nonconformance report issued in August 1996 (N-96-05) identified this failure as a power supply malfunction that resulted in a low detector bias voltage supplied to the logging tool. This malfunction occurred in the mornings immediately following system start-up, but ceased after an extra long warm-up period (about 1 to 2 hours). The nonconformance report also documents that concentrations calculated from data collected in the first 2 hours of logging could be systematically understated by about 10 percent. Therefore, the data may show a repeatability problem upon relogging of the borehole in the future.

The post-survey field verification spectra for both log runs passed the acceptance criteria for the peak shape and system efficiency, providing evidence that the logging system was operating appropriately after an initial warm-up time. The energy calibration and peak-shape calibration from verification spectra that successfully met the established acceptance criteria were used to establish the channel-to-energy parameters used in processing the spectra acquired during the logging operation. Corrections for gain drifts during data collection were not necessary during processing of the data to maintain proper peak identification.

Casing correction factors for a 0.280-in.-thick steel casing were applied during analysis.

The man-made radionuclides Cs-137 and Co-60 were detected in this borehole. The presence of Cs-137 was measured almost continuously from the ground surface to about 57 ft and at the bottom of the borehole. The maximum Cs-137 concentration was 38.6 pCi/g at 1 ft. Measurable Co-60 concentrations were detected almost continuously from the ground surface to about 9 ft and intermittently from 9 to 53.5 ft. The maximum Co-60 concentration was 1.3 pCi/g at 3.5 ft.

The KUT concentration values increase at about 75 ft.

Additional information and interpretations of log data are included in the main body of the Tank Summary Data Reports for tanks S-102 and S-103.

### Log Plot Notes:

Separate log plots show the man-made and the naturally occurring radionuclides. The natural radionuclides can be used for lithology interpretations. The headings of the plots identify the specific gamma rays used to calculate the concentrations.

A combination plot includes the man-made and natural radionuclides, the total gamma derived from the spectral data, and the Tank Farms gross gamma log. The gross gamma plot displays the latest available digital data. No attempt has been made to adjust the depths of the gross gamma logs to coincide with the SGLS data.

Uncertainty bars on the plots show the statistical uncertainties for the measurements as 95-percent confidence intervals. Open circles on the plots give the MDL. The MDL of a radionuclide represents the lowest



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concentration at which positive identification of a gamma-ray peak is statistically defensible.

A time-sequence plot was generated from the historical gross gamma logs from 1975 to 1993 and the plot is included with the SGLS logs.